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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,396	11/19/2003	Takashi Iwamoto	36856.1155	5653

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EXAMINER

DOUGHERTY, THOMAS M

ART UNIT PAPER NUMBER

2834

DATE MAILED: 08/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/715,396	<b>Applicant(s)</b> IWAMOTO, TAKASHI	
	<b>Examiner</b> Thomas M. Dougherty	<b>Art Unit</b> 2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 15 August 2006.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-11 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 5 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Sakai (JP 2001-196488). Sakai shows (fig. 1) an electronic component comprising: a substrate (1); at least one piezoelectric vibrating portion (2) and a connecting portion (3c) provided on the substrate (1); and a structural piece (5) made of a resin material having a flat plate shaped and directly covering at least the at least one piezoelectric vibrating portion so that no structural elements are disposed therebetween the structural piece and the at least one piezoelectric vibrating portion; wherein the structural piece (5) has an integrated structure and is provided with a concavity including a top portion and side walls covering the at least one piezoelectric vibrating portion, the concavity defining a space so as not to disturb at least the vibration of the piezoelectric vibrating portion.

The structural piece (5) seals at least one piezoelectric vibrating portion.

Regarding claims 5 and 6, recitation of how the concavity is formed is not further limiting to the claimed structure and is therefore no germane to the issue of the patentability of the device itself. Therefore, these limitations have not been given patentable weight.

Claims 1, 2, 5, 6 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamamoto et al. (US 6,307,300). Yamamoto et al. show (abstract figure) an

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electronic component comprising: a substrate (10); at least one piezoelectric vibrating portion (1) and a connecting portion (13) provided on the substrate (10); and a structural piece (20) made of a resin material having a flat plate shaped and directly covering at least the at least one piezoelectric vibrating portion and directly covering at least the at least one piezoelectric vibrating portion so that no structural elements are disposed therebetween the structural piece and the at least one piezoelectric vibrating portion; wherein the structural piece (20) has an integrated structure and is provided with a concavity including a top portion and side walls covering the at least one piezoelectric vibrating portion, the concavity defining a space so as not to disturb at least the vibration of the piezoelectric vibrating portion.

The structural piece (20) seals at least one piezoelectric vibrating portion.

Regarding claims 5 and 6, recitation of how the concavity is formed is not further limiting to the claimed structure and is therefore no germane to the issue of the patentability of the device itself. Therefore, these limitations have not been given patentable weight.

The structural piece (20) includes at least one through hole.

Claims 1, 2, 5, 6 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Kishimoto et al. (US 2001/0004180). Kishimoto et al. show (abstract figure) an electronic component comprising: a substrate (10); at least one piezoelectric vibrating portion (1) and a connecting portion (16) provided on the substrate (10); and a structural piece (4) made of a resin material having a flat plate shaped and directly covering at least the at least one piezoelectric vibrating portion and directly covering at least the at

least one piezoelectric vibrating portion so that no structural elements are disposed therebetween the structural piece and the at least one piezoelectric vibrating portion; wherein the structural piece (4) has an integrated structure and is provided with a concavity including a top portion and side walls covering the at least one piezoelectric vibrating portion, the concavity defining a space so as not to disturb at least the vibration of the piezoelectric vibrating portion.

The structural piece (4) seals at least one piezoelectric vibrating portion.

Regarding claims 5 and 6, recitation of how the concavity is formed is not further limiting to the claimed structure and is therefore not germane to the issue of the patentability of the device itself. Therefore, these limitations have not been given patentable weight.

The structural piece (4) includes at least one through hole.

Claims 1, 2, 5 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Baba et al. (US 2002/0189832). Baba et al. show (abstract figure) an electronic component comprising: a substrate (102); at least one piezoelectric vibrating portion (104) and a connecting portion (107) provided on the substrate (102); and a structural piece (103) made of a resin material having a flat plate shaped and directly covering at least the at least one piezoelectric vibrating portion and directly covering at least the at least one piezoelectric vibrating portion so that no structural elements are disposed therebetween the structural piece and the at least one piezoelectric vibrating portion; wherein the structural piece (103) has an integrated structure and is provided with a concavity including a top portion and side walls covering the at least one piezoelectric

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vibrating portion, the concavity defining a space so as not to disturb at least the vibration of the piezoelectric vibrating portion.

The structural piece (103) seals at least one piezoelectric vibrating portion.

Regarding claims 5 and 6, recitation of how the concavity is formed is not further limiting to the claimed structure and is therefore not germane to the issue of the patentability of the device itself. Therefore, these limitations have not been given patentable weight.

Claims 1, 2, 5 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Tsuda et al. (US 2002/0047501). Baba et al. show (abstract figure) an electronic component comprising: a substrate (3); at least one piezoelectric vibrating portion (1) and a connecting portion (9) provided on the substrate (3); and a structural piece (6) made of a resin material having a flat plate shaped and covering at least the at least one piezoelectric vibrating portion: wherein the structural piece (6) has an integrated structure and is provided with a concavity including a top portion and side walls covering the at least one piezoelectric vibrating portion, the concavity defining a space so as not to disturb at least the vibration of the piezoelectric vibrating portion.

The structural piece (6) seals at least one piezoelectric vibrating portion.

Regarding claims 5 and 6, recitation of how the concavity is formed is not further limiting to the claimed structure and is therefore not germane to the issue of the patentability of the device itself. Therefore, these limitations have not been given patentable weight.

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Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over any of Sakai (JP 2001-196488) or Kishimoto et al (US 2001/004180) or Yamamoto et al. (US 6,307,300) or Baba et al. (US 2002/0189832) in view of Katsuta (JP 2000-261284). Given the inventions of Sakai and the others as noted above, none shows their structural piece including a mounting portion provided on the upper surface thereof, and is provided with a connecting wiring for electrically connecting the mounting portion and the connecting portion.

Katsuta shows (abstract figure) an electronic component comprising: a substrate (1); at least one piezoelectric vibrating portion (2) and a connecting portion (3) provided on the substrate (1); and a structural piece (6) made of an insulator material having a flat plate shaped and covering at least the at least one piezoelectric vibrating portion (2): wherein the structural piece (6) has an integrated structure and is provided with a concavity including a top portion and side walls covering the at least one piezoelectric vibrating portion (2), the concavity (G) defining a space so as not to disturb at least the vibration of the piezoelectric vibrating portion.

Katsuta shows his structural piece (6) including a mounting portion (7) provided on the upper surface thereof, and is provided with a connecting wiring (5) for electrically connecting the mounting portion (7) and the connecting portion (3).

Katsuta does not show that no structural elements are disposed therebetween the structural piece and the at least one piezoelectric vibrating portion.

It would have been obvious to one having ordinary skill in the art to employ the mounting, wiring and connecting arrangement of Katsuta in any of the devices of Sakai

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or the others, at the time of their inventions in order to make a smaller device which Katsuta notes.

Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over any of Sakai (JP 2001-196488) or Kishimoto et al (US 2001/004180) or Yamamoto et al. (US 6,307,300) or Baba et al. (US 2002/0189832) in view of Suga et al. (US 2002/0140322 A1). Given the inventions of Sakai and the others as noted above, it is not explicitly clear which materials are employed for their structural components.

Suga et al. show (figs. 3 and 6) an electronic component comprising: a substrate (1); at least one piezoelectric vibrating portion (area at excitation electrodes, 21) and a connecting portion (20) provided on the substrate (1); and a structural piece (6) made of a resin material having a flat plate shape; wherein the structural piece (6) has an integrated structure and is provided with a concavity (210) including side walls, the concavity defining a space so as not to disturb at least the vibration of the piezoelectric vibrating portion.

The structural piece (6) seals at least one piezoelectric vibrating portion (see paragraph 33).

The structural piece (6) includes a mounting portion (5) provided on the upper surface thereof, and is provided with a connecting wiring (4) for electrically connecting the mounting portion (5) and the connecting portion (20).

The mounting portion (5) does not overlay the connecting portion (20) in a thickness direction of the structural piece (6). Note that the mounting portions (5) do not touch the substrate but are prevented from it since they reside on the connection



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portions (20) and thus do not overlap the connection portions (20) in a thickness direction.

Their structural piece (see fig. 6) is made of a polyimide film or a liquid crystal polymer film.

The structural piece is made from a photosensitive material (polyimide resin, epoxy).

The substrate is made of a material selected from the group consisting of LiTaO<sub>3</sub>, quartz, LinbO<sub>3</sub> and Li<sub>2</sub>B<sub>4</sub>O<sub>7</sub>. See paragraph 40.

Suga et al. note use of electrodes with a material selected from the group consisting of Al, Cu, an Al-Cu alloy and Au. See paragraph 41.

Suga et al. don't show the structural piece covering at least the at least one piezoelectric vibrating portion. It is not clear that the electrodes of the piezoelectric vibrating portion is made of a material selected from the group consisting of Al, Cu, and Al-Cu alloy and Au.

It would have been obvious to one having ordinary skill in the art to employ the photosensitive polyimide resin material and a material selected from the group Al, Cu, and Al-Cu alloy and Au for the electrodes of the piezoelectric vibrating portion in the device of Sakai or the others at the time of that invention as suggested by Suga et al. since the former material is easy to shape and the latter materials are known, good conductive elements. It would also have been obvious to one having ordinary skill in the art to employ a LiTaO<sub>3</sub> component in the device of Sakai, as is taught by Suga et al. because this material is a reliable and well-known material for just such devices.

Additionally, it would have been obvious to one having ordinary skill in the art to employ a structural piece covering at least the at least one piezoelectric vibrating portion in the device of Suga et al. as is taught by Sakai in order to provide more protection for the device.

Finally, It would have been obvious to one having ordinary skill in the art to employ the materials claimed by the applicants since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

***Allowable Subject Matter***

Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: while the prior art shows a substrate with a piezoelectric vibrating portion directly covered by a resin material with a flat shape and with a concavity above the vibrating portion further comprising a sealed arrangement and a mounting portion on the cover for connecting by wire to a connecting portion on the substrate it does not show nor fairly suggest placement of the mounting portion anywhere but directly over the connecting portion, thus it does not meet the feature of having a mounting portion not overlapping the connecting portion which allows for a free placement of the mounting portion for the purpose of signal provision.

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***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The additional prior art cited reads on some aspects of the claimed invention.

Direct inquiry to Examiner Dougherty at (571) 272-2022.

*tmd*  
tmd

August 22, 2006

*Thomas M. Dougherty*  
**TOM DOUGHERTY**  
**PRIMARY EXAMINER**